

REMARKS

The Office Action dated March 22, 2005 has been received and carefully noted. The above amendments to the Claims, and the following remarks, are submitted as a full and complete response thereto.

In accordance with the foregoing, claims 1, 4, 7-9, 22, 24-25, 28-30, 34-36, 38, 41, and 43 have been amended to improve clarity of the features recited therein and claims 3, 5, 6, 23, and 42 have been cancelled, without prejudice or disclaimer. No new matter is being presented, and approval and entry are respectfully requested. As will be discussed below, it is also requested that all of claims 1, 4, 7-22, 24-41, and 43 be found allowable as reciting patentable subject matter.

Claims 1, 4, 7-22, 24-41, and 43 stand rejected and pending and under consideration.

REJECTIONS UNDER 35 U.S.C. § 102:

In the Office Action, at page 2, claims 1 and 3-43 were rejected under 35 U.S.C. § 102 as being anticipated by U. S. Patent No. 6,756,938 to Zhao et al. ("Zhao"). The Office Action took the position that Zhao describes all the recitations of independent claims 1, 22, 28, 34, 41, and 43 and related dependent claims. Reconsideration is requested.

Independent claim 1, upon which claims 4 and 7-21 are dependent, recites a providing a method for estimating altitude of a communications device. The method includes estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system. The method also includes estimating the altitude of the communications device based at least on altitudes of the at least two antennas of a communications system and on the two-dimensional location estimate of the communications device.

Independent claim 22, upon which claims 24-27 are dependent, recites a method for providing location assistance information to a communications device communicating with a communications system via at least two antennas of the communications system. The method includes estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system; and estimating an altitude estimate of the communications device based at least on altitude information of the at least two antennas. The method also includes determining location assistance information based on the two-dimensional location estimate and the altitude estimate of the communications device.

Independent claim 28, upon which claims 29-33 are dependent, recites a communications system including first estimation means for estimating a two-dimensional location estimate of a communications device based on signal measurements relating to at least two antennas of the communications system; and storage means for storing antenna information representing at least altitudes of antennas of the

communications system. The communications system also includes second estimation means for estimating an altitude of a communications device based at least on altitudes of at least two antennas of the communications system and on the two-dimensional location estimate of the communications device.

Independent claim 34, upon which claims 35-40 are dependent, recites a network element for a communications system. The network element includes first estimation means for estimating a two-dimensional location estimate of a communications device based on signal measurements relating to at least two antennas of the communications system; and first determination means for determining antenna information representing at least altitudes of the at least two antennas of the communications system. The network element also includes second estimation means for estimating an altitude of the communications device based at least on altitudes of the at least two antenna of the communications system and on the two-dimensional location estimate of the communications device.

Independent claim 41 recites a computer readable medium containing executable computer program instructions which, when executed by a data processing system, cause the data processing system to perform a method including estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system; and estimating the altitude of the communications device based at least on altitudes of the at least two antennas of a

communications system and on the two-dimensional location estimate of the communications device.

Independent claim 43 recites a method for providing location assistance information to a communications device communicating with a communications system. The method includes estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system; and estimating an altitude estimate of the communications device based at least on altitude information of the at least two antennas of the communications system and on the two-dimensional location estimate. The method includes determining location assistance information based on the two-dimensional location estimate and the altitude estimate of the communications device.

As will be discussed below, Zhao fails to disclose or suggest the elements of any of the presently pending claims.

Zhao generally describes a method for determining a location of a satellite positioning system receiver. See column 2, lines 17- 24. A coarse altitude is used to determine an estimated location of the receiver. The coarse altitude is the average altitude of the serving cell site or portion thereof or altitude of the base station antenna. See column 2, lines 51-67. According to Zhao, the course altitude may be also obtained from altitude stored on the receiver by averaging 3-dimensional position fixes stored at the receiver. If only a 2-dimensional solution is available, according to Zhao, the coarse altitude can be used as the derived altitude. See column 3, lines 6-12.

However, Zhao does not teach or suggest, “estimating a two-dimensional location estimate of the communications device based on signal measurements related to at least two antennas of a communications system,” as recited in independent claims 1, 41, and 43. There is no teaching provided in Zhao that would provide that the 2-dimensional solution uses signal measurements relating to at least two antennas of the system. Instead, Zhao provides that the information about the base station antennas is used only for the coarse altitude estimation. Zhao does not teach or suggest that the signal measurements between the communications device including GPS receiver and the communications system would be used for determining a two-dimensional location estimate of the communications device.

An advantage of using signal measurements relating to antennas of a wireless communication system for location estimation, as in the present invention, is that signal measurements provide a more accurate location estimation and, thus, a more accurate altitude estimation for the communication device.

Independent claim 8 recites, “estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system and based on identity information of at least two cells corresponding to said at least two antennas of said communications system,” independent claim 22 recites, “estimating a two-dimensional location estimate of the communications device based on signal measurements relating to at least two antennas of a communications system; estimating an altitude estimate of the communications device

based at least on altitude information of said at least two antennas,” and independent claims 28 and 34 recite, “first estimation means for estimating a two-dimensional location estimate of a communications device based on signal measurements relating to at least two antennas of said communications system.” Because independent claims 8, 22, 28, and 34 include similar claim features as those recited in independent claim 1, although of different scope, and because the Office Action refers to similar portions of the cited references to reject independent claims 8, 22, 28, and 34, the arguments presented above supporting the patentability of independent claim 1 are incorporated herein to support the patentability of independent claims 8, 22, 28, and 34.

Accordingly, in view of the foregoing, it is respectfully requested that independent claims 1, 8, 22, 28, 34, 41, and 43 and related dependent claims be allowed.

CONCLUSION:

In view of the above, Applicant respectfully submits that the claimed invention recites subject matter which is neither disclosed nor suggested in the cited prior art. Applicant further submits that the subject matter is more than sufficient to render the claimed invention unobvious to a person of skill in the art. Applicant therefore respectfully requests that each of claims 1, 4, 7-22, 24-41, and 43 be found allowable and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by

telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the Applicant respectfully petitions for an appropriate extension of time.

Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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